

Amendments to the Claims

This listing of claims will replace all prior versions of the claims in this application:

Listing of the Claims:

35. (previously presented) An orbital welding process for joining adjacent ends of two heavy wall duplex stainless steel tubes comprising

- (a) applying a high refractory flux to the heat affect zone formed by the adjacent tube ends to be welded, and
- (b) arc welding the adjacent tube ends together in a single orbital pass using a non-pulsed arc.

36. (previously presented) The process of claim 29, wherein the flux includes at least one of silica, titania, magnesia, chromia and a titanium oxide.

37. (previously presented) The process of claim 36, wherein the refractory flux comprises a mixture of Cr_2O_3 , SiO_2 and an oxide of titanium.

38. (previously presented) The process of claim 37, wherein the refractory flux comprises a mixture of about 30 to 70 wt.% of a titanium dioxide, about 20 to 76 wt.% Cr_2O_3 , and about 5 to 27 wt.% SiO_2 .

39. (previously presented) The process of claim 38, wherein the wall thickness of the tubing being welded is greater than 2 mm.

40. (previously presented) The process of claim 36, wherein the wall thickness of the tubing being welded is greater than 2 mm.

41. (previously presented) The process of claim 35, wherein the wall thickness of the tubing being welded is greater than 2 mm.

42. (previously presented) The process of claim 35, wherein a weld filler made from a steel containing more austenite than the duplex steel tubes being welded together is placed between the adjacent tube ends to be welded. .

43. (previously presented) The process of claim 42, wherein the weld filler contains more nickel than the duplex steel forming the tubes being welded together.

45. (new) The process of claim 42, wherein welding is accomplished by an orbital welding machine.

46. (new) The process of claim 38, wherein welding is accomplished by an orbital welding machine.

47. (new) The process of claim 35, wherein welding is accomplished by an orbital welding machine.

48. (new) An orbital welding process for joining adjacent ends of two duplex stainless steel tubes comprising

- (a) applying a high refractory flux to the heat affect zone formed by the adjacent tube ends to be welded, and
- (b) arc welding the adjacent tube ends together in a single orbital pass using a non-pulsed electrical arc.

49. (new) The process of claim 48, wherein welding is accomplished by an orbital welding machine.

50. (new) The process of claim 49, wherein the flux includes at least one of silica, titania, magnesia, chromia and a titanium oxide.

51. (new) The process of claim 50, wherein the refractory flux comprises a mixture of Cr_2O_3 , SiO_2 and an oxide of titanium.

52. (new) The process of claim 51, wherein the refractory flux comprises a mixture of about 30 to 70 wt.% of a titanium dioxide, about 20 to 76 wt.% Cr_2O_3 , and about 5 to 27 wt.% SiO_2 .

53. (new) The process of claim 49, wherein a weld filler made from a steel containing more austenite than the duplex steel tubes being welded together is placed between the adjacent tube ends to be welded.

54. (new) The process of claim 53, wherein the weld filler contains more nickel than the duplex steel forming the tubes being welded together.

55. (new) The process of claim 49, wherein the orbital welding process produces a weld bead having a penetration characteristic of 0.33 or greater.

56. (new) The process of claim 49, wherein orbital welding is carried out in an enclosed system so as to shield the gap between the electrode producing the arc and the tubing being welded from atmospheric oxygen.

57. (new) The process of claim 56, wherein the gap is flushed with a shield gas non-reactive with the weld pool and high refractory flux.

58. (new) The process of claim 57, wherein the shield gas is helium, argon, neon, xenon or mixtures thereof.

59. (new) The process of claim 49, wherein a weld ring formed from a weld filler material is placed between tube ends to be welded.

60. (new) The process of claim 59, wherein the weld ring is T-shaped in cross section so that the ring can be slipped onto a tube end.

61. (new) The process of claim 60, wherein the flux is applied to an outer surface of the weld ring.